

OPTICAL IMAGE RECORDING SYSTEM, AND ASSOCIATED PROCESSING SYSTEM

5 PATENT CLAIMS

1. An optical image recording system for electronic recording of optical information, said optical image recording system comprising

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a lens system (21,22,23), and a body (20);

15 said body having a configuration with a low height (b) and with broad surfaces (201,202) through one of which broad surfaces said optical information is being received, and said body accommodating an image recording device (25) having a light sensitive area, a memory, and means for transferring and receiving electronic signals;

20 CHARACTERIZED in

that said lens system is accommodated in said body;

25 that said lens system comprises: a front lens group (21) having a first optical axis (211), a back lens group (22) consisting of one or more lenses having a second optical axis (221), and a reflective element (23) folding the first optical axis (211) into the second optical axis (221) in an angle (a) of less than 180 degrees; and

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that said lens system has a ratio (S) of the optical system height (H) divided by the diameter (D) of the circumferential circle of the formed image (28) less than

4, said optical system height (H) being the maximum projected distance on the first optical axis from any part of the optical system including lenses, filters, aperture stop, image recording device and the body thereof;

and that said body has a height (b) so that said optical image recording system can be accommodated in a compact, flat camera which can be kept in a wallet or a small handbag designed for carrying credit cards.

2. A system according to claim 1, wherein the lens system comprises an additional reflective element (24) folding the second optical axis (221) into the optical axis (251) of the image recording device.

A 3. A system according to claims 1 and 2, wherein the first optical axis (211) and the second optical axis (221) form an angle (a) equal to or less than 90 degrees.

20 4. A system according to claims 1-3, wherein the second optical axis (221) and the optical axis (251) of the image recording device form an angle equal to or less than 90 degrees.

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- A 5. A system according to claims 1-4, wherein the first optical axis (211) and the optical axis (251) of the image recording device are substantially in the same plane.
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- A 6. A system according to claims 1-5, wherein the first optical axis (211) and the optical axis (251) of the image recording device are substantially parallel.
- 10 7. A system according to claim 1, wherein the image recording device is a charge coupled device.
8. A system according to claim 1, wherein the lens system has a ratio (S) of the optical system height (H) divided by the diameter (D) of the circumferential circle of the formed image (28) equal to or less than 2.55, more preferred equal to or less than 1.7, most preferred less than 1.2.
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- 20 9. A system according to claim 1, wherein the height ratio of the effective lens height (h) and the effective focal length (f) of the lens system is less than 1.7, preferably less than 1.5.
- A 25. 10. A system according to claims 1-9, wherein the height of said body is less than 20 mm, preferably less than or equal to 10.5 mm, more preferably less than or equal to 7 mm, most preferably less than or equal to 5 mm.
- A 30. 11. A system according to claims 1-10, wherein the front lens group (21) and the first reflective element (23) consist of a prism.

- A 12. A system according to claims 1-11, wherein the additional reflective element (24) consist of a prism.
- A 13. A system according to claims 1-12, wherein the aperture stop of the lens system is determined by a stop (26) placed after the first reflective element, particularly placed in the back lens group (22).
- A 14. A system according to claims 1-13, wherein said body further comprises means for storing, transferring and receiving electronic signals of other information than optical information to and from an external device.
15. A system according to claim 14, wherein the means for transferring and receiving electronic signals comprises a connector device (1001) having a databus interface.
16. A system according to claim 15, wherein the connector device is accommodated in an end face of said body.
- 20 17. A system according to claim 14, wherein the storage means for storing the electronic signals consist of an exchangeable memory (1002).
- A 25 18. A system according to claims 1-17, wherein the body further comprises means for storing electronic signals of control information for controlling the operation of the external device.
- 30 19. A system according to claim 18, which comprises means for loading the control information into the external device.

- A 20. A system according to claims 14-19, wherein the means for transferring electronic signals comprise a wireless transmitter of analogue and/or digital transmission.
- A 21. A system according to claims 14-19, wherein the means for receiving electronic signals comprise a wireless receiver of analogue and/or digital transmission.
- A 22. A system according to claims 1-21, wherein said body further comprises guiding means for its guidance in a slot.
23. An optical image recording and processing system for recording and processing of electrical signals of optical information and other information; said system comprising an optical image recording system according to claims 1-22; wherein said means for transferring and receiving electronic signals consist of a pair of connector devices (1001,1301) having a databus interface, wherein one connector device (1001) of said pair of connector devices is accommodated in the optical image recording system for direct connection to the other of said pair of connector devices (1301) accommodated in the image processing system.
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24. A system according to claim 23, wherein the connector device of the optical image recording system is accommodated in the end face thereof.
- A 30. 25. A system according to claims 23-24, wherein the image processing system accommodates the connector device (1301) in a slot (1102).
- A 35. 26. A system according to claims 23-25, wherein the optical image recording system and the processing system

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comprise guiding means (1004, 1101) for guiding their mutual connection.

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~~27. A system according to claims 23-26 comprising an optical image recording system according to claims 1-22.~~